Planning and Cabling Networks

Network Fundamentals – Chapter 10

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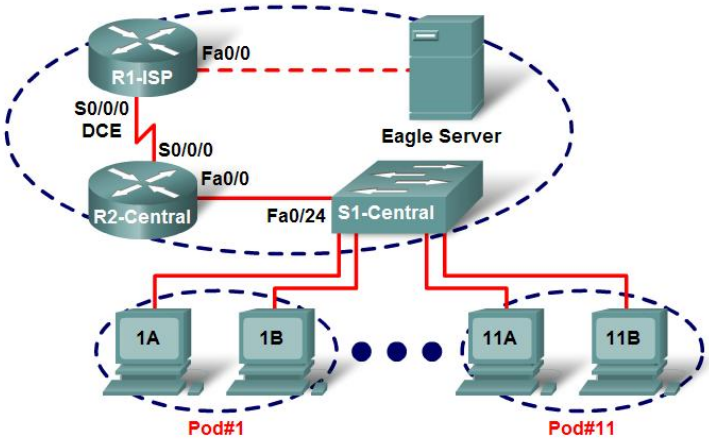
Version 4.0

Objectives

- Identify the basic network media required to make a LAN connection.
- Identify the types of connections for intermediate and end device connections in a LAN.
  - Identify the pin out configurations for straight-through and crossover cables.
  - Identify the different cabling types, standards and ports used for WAN connections.
  - Define the role of device management connections when using Cisco equipment.
- Design an addressing scheme for an inter-network and assign ranges for hosts, network devices and the router interface.
- Compare and contrast the importance of network designs.

Basic Network Media Required to Make a LAN Connection

- Select the appropriate hardware, including the cabling, to install several computers together in a LAN



Planning & Cabling a Network

Basic Network Media Required to Make a LAN Connection

- To identify some key aspects of the devices they will be employing in a LAN

Factors to Consider in Choosing a Device

COST

PORTS

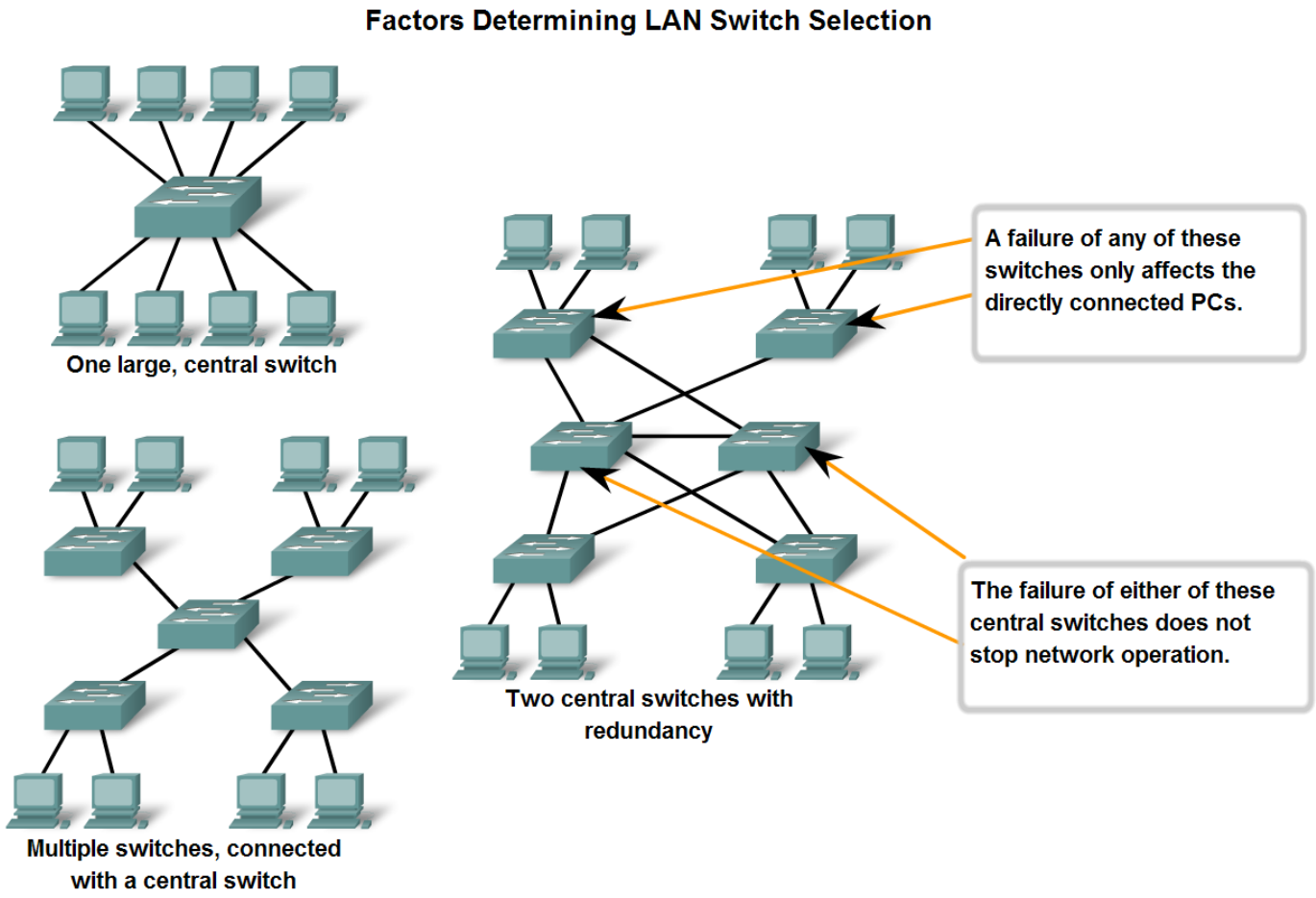
SPEED

EXPANDABLE/ MODULAR

MANAGEABLE

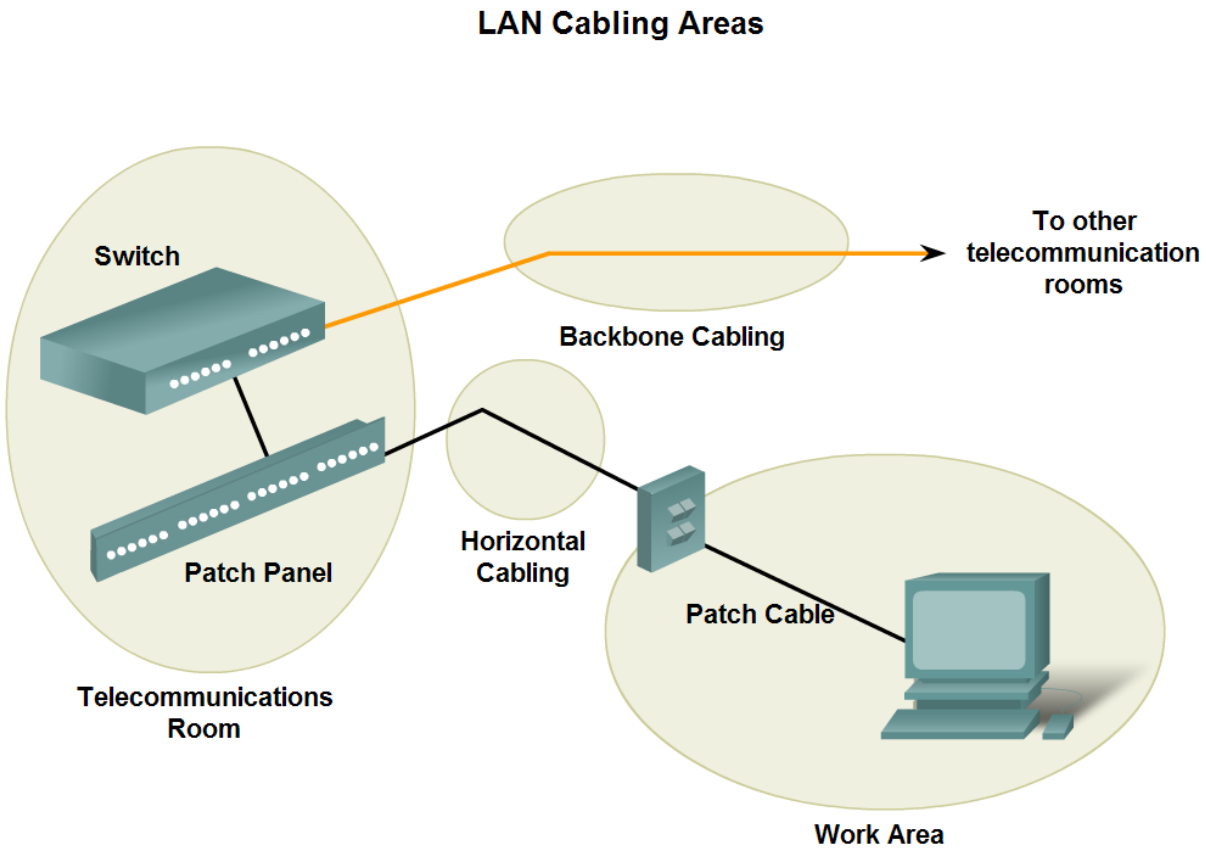
Basic Network Media Required to Make a LAN Connection

- Connect two computers with a switch



Types of Connections in a LAN

- Given a specific network connection, identify the type of cable required to make the connection

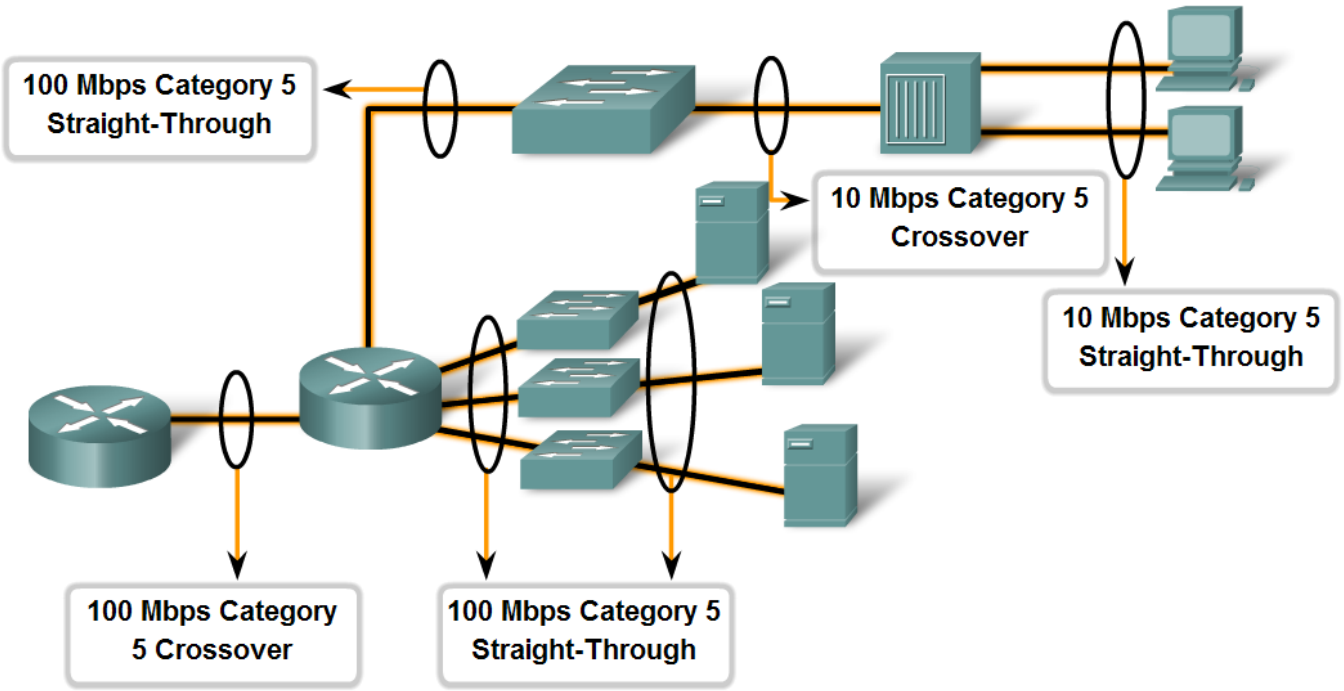


Types of Connections in a LAN

- Identify the correct cable to use in connecting intermediate and end devices in a LAN

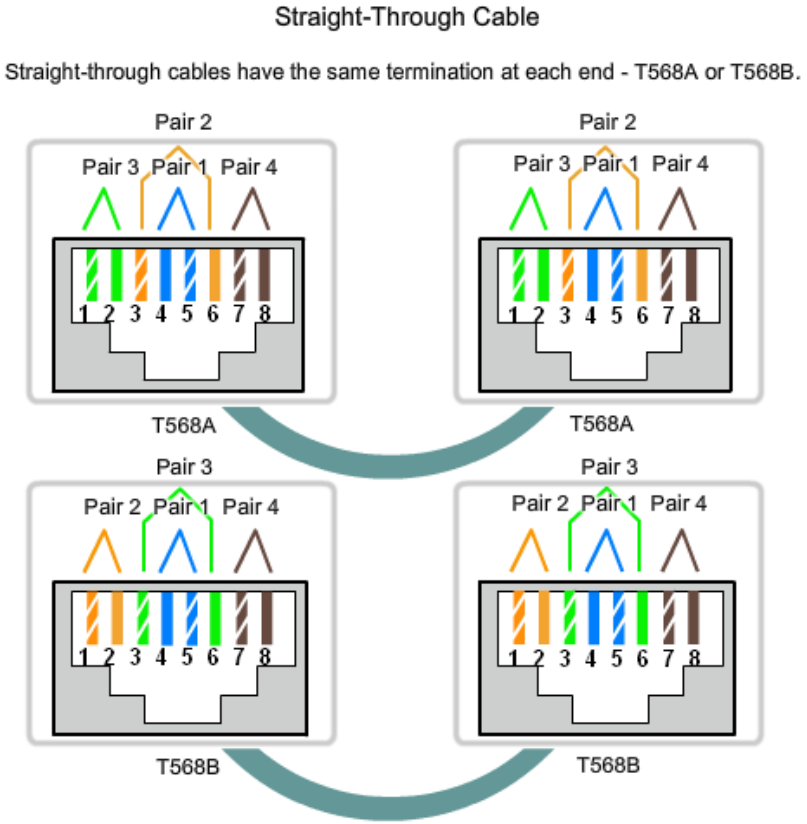
Making LAN Connections

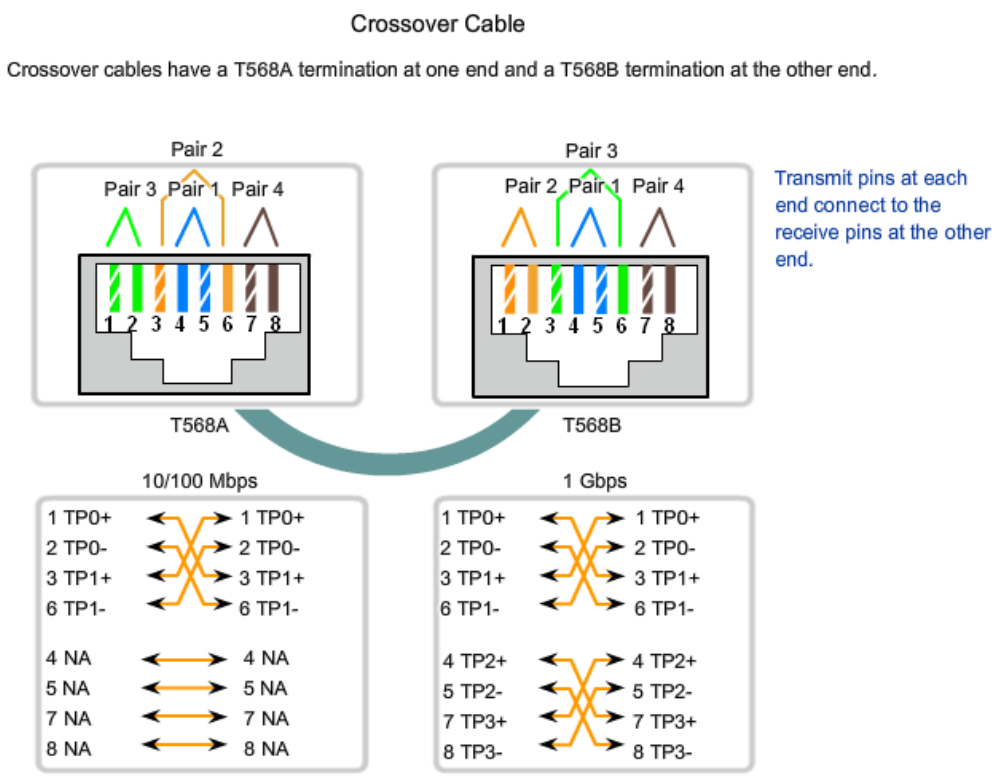
Identify the correct UTP cable type and likely category to connect different intermediate and end devices in a LAN.



Types of Connections in a LAN

- Identify the pinout of the straight-through and cross-over cables





Types of Connections in a LAN

- Recognize that a different class of cables is used to connect WANs, and that the cables, standards and ports are different than those in use by LANs

Types of WAN Connections

Cisco HDLC	PPP	Frame Relay	DSL Modem	Cable Modem
EIA/TIA-232 EIA/TIA-449 X.21V.24 V.35 High Speed Serial Interface (HSSI)			RJ-11 Note: Works over telephone line	F Note: Works over Cable TV line

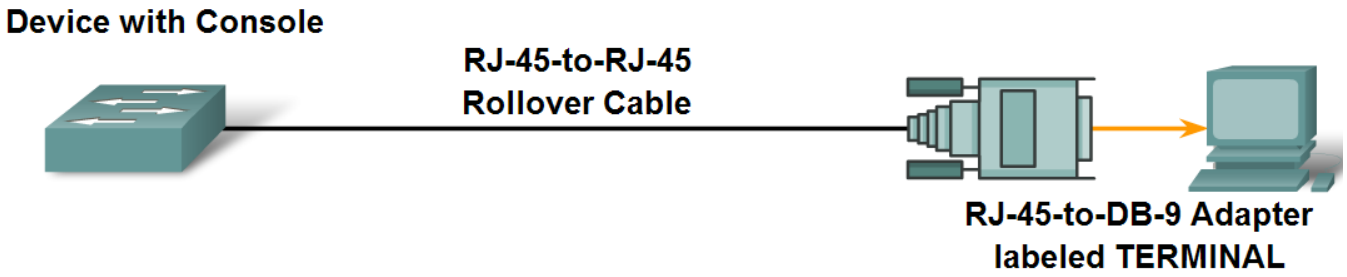
Router: Male Smart Serial

Network: Male Winchester Block Type

Types of Connections in a LAN

- Define the role of device management connections when using Cisco equipment

The Device Management Connection



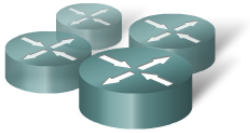
- PCs require an RJ-45 to DB-9 or RJ-45 to DB-25 adapter.
- COM port settings are 9600 bps, 8 data bits, no parity, 1 stop bit, no flow control.
- This provides out-of-band console access.
- AUX switch port may be used for a modem-connected console.

Design an Addressing Scheme for an Internetwork

- Design an address scheme for an internetwork and assign ranges for hosts, network devices and the router interface

Determining the Number of Hosts in the Network

Include these devices in the count:



Router Interfaces
Count the number of interfaces, and not the number of routers

Printers

IP Phones
Count other specialty IP devices as well

Switch Management Addresses

Administration Users

General Users

Servers

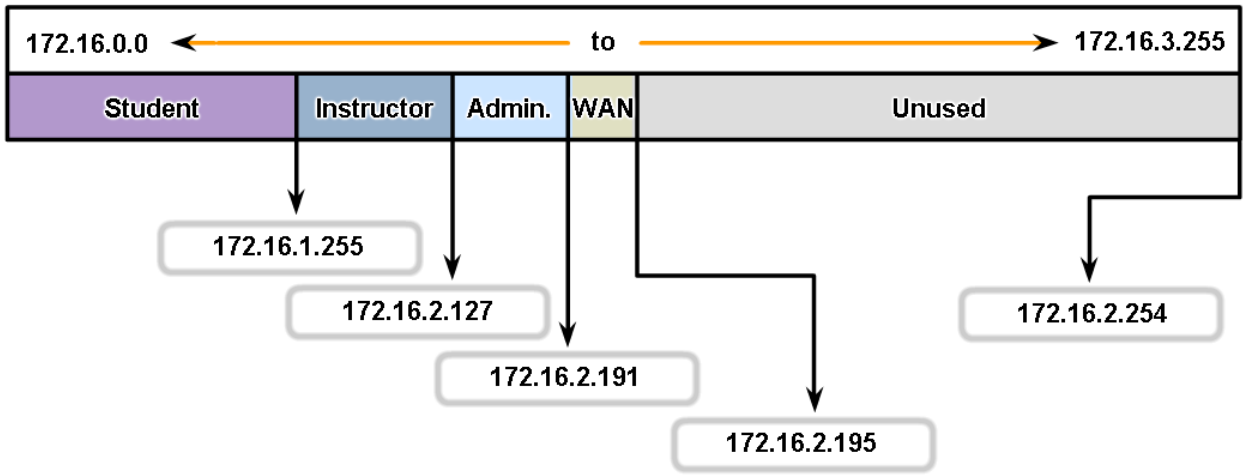
Design an Addressing Scheme for an Internetwork

- Calculate the address ranges for sub networks

Calculating Addresses with VLSM Address Ranges for Subnets

Case 1

Network	Subnet Address	Host Address Range		Broadcast Address
Student	172.16.0.0/23	172.16.0.1	172.16.1.254	172.16.1.255
Instructor	172.16.2.0/25	172.16.2.1	172.16.2.126	172.16.2.127
Administration	172.16.2.128/26	172.16.2.129	172.16.2.190	172.16.2.191
WAN	172.16.2.192/30	172.16.2.193	172.16.2.194	172.16.2.195
Unused	na	172.16.2.197	172.16.3.254	na



Importance of Network Designs

- Given a network scenario, develop an appropriate networking scheme

Importance of Network Designs

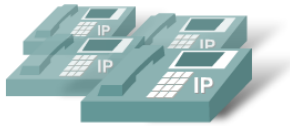
- Determine the total number of hosts in a network, accounting for present and future requirements

Determining the Number of Hosts in the Network

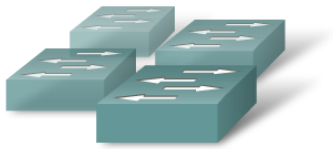
Include these devices in the count:

Router Interfaces
Count the number of interfaces, and not the number of routers

Printers



IP Phones
Count other specialty IP devices as well



Switch Management Addresses

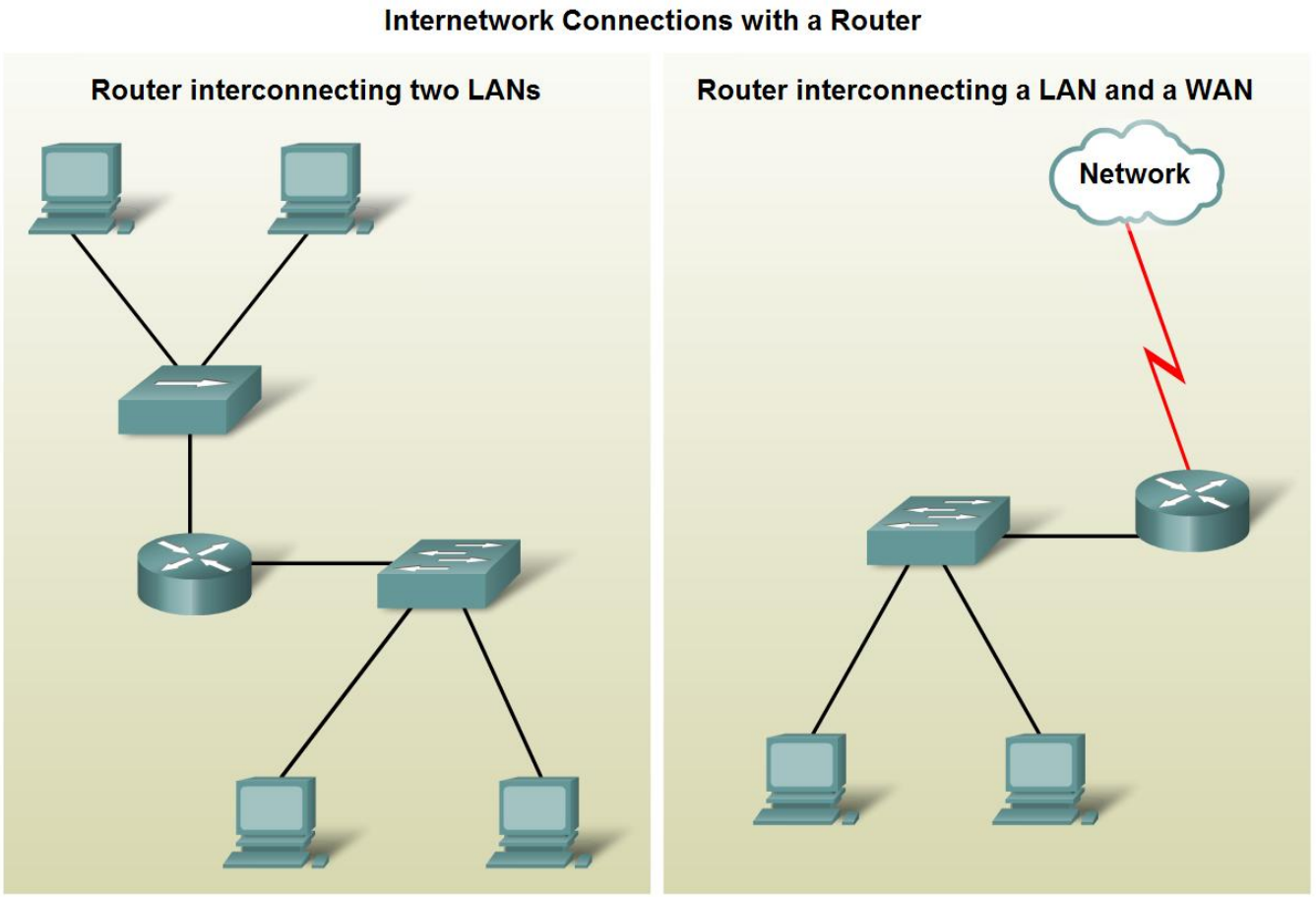
Administration Users

General Users

Servers

Importance of Network Designs

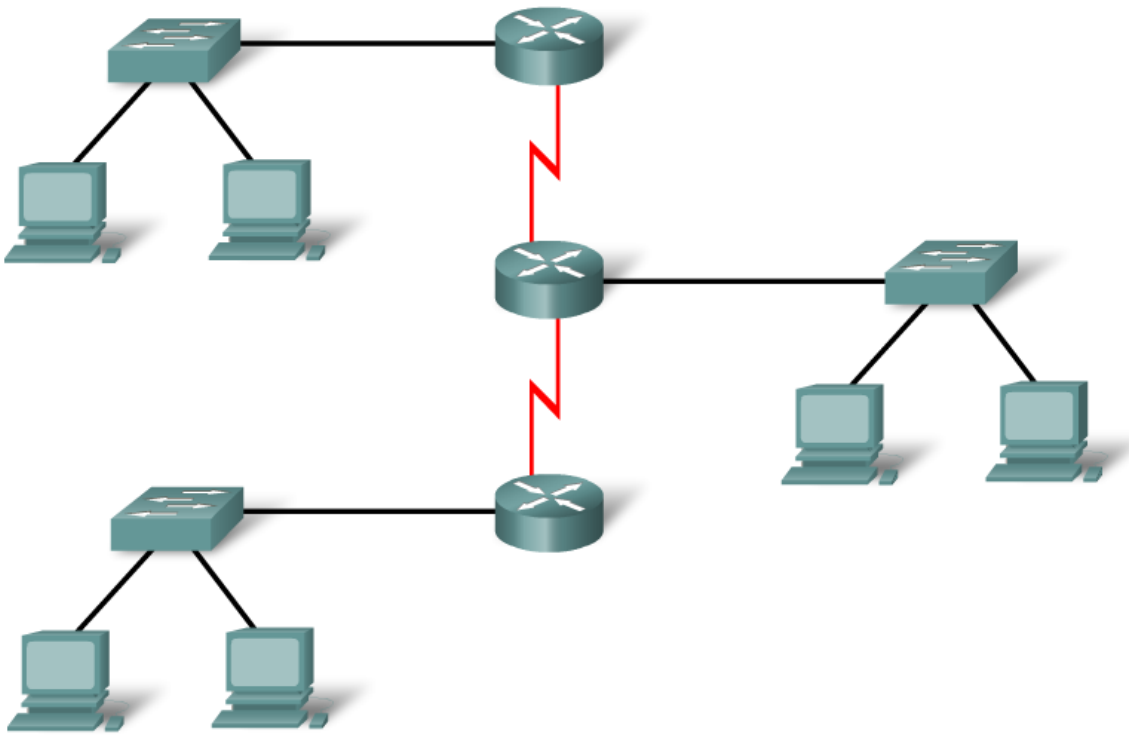
- Given a network requirement, determine the optimum number of sub networks in the larger internetwork



Importance of Network Designs

- Describe how to count the segments between router interfaces

Counting Subnets



Summary

In this chapter, you learned to:

- Identify the basic network media required to make a LAN connection.
- Identify the types of connections for intermediate and end device connections in a LAN.
- Identify the pinout configurations for straight-through and crossover cables.
- Identify the different cabling types, standards, and ports used for WAN connections.
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